

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

---

In re Patent Application of:  
Liliana Bagala' Rampazzo et al.

Application No.: 10/523,101

Confirmation No.: 8413

Filed: February 1, 2005

Art Unit: 1709

---

For: SPIROBIFLUORENE DERIVATIVES, THEIR  
PREPARATION AND USES THEREOF

---

Examiner: M. E. Nelson

1.132 DECLARATION

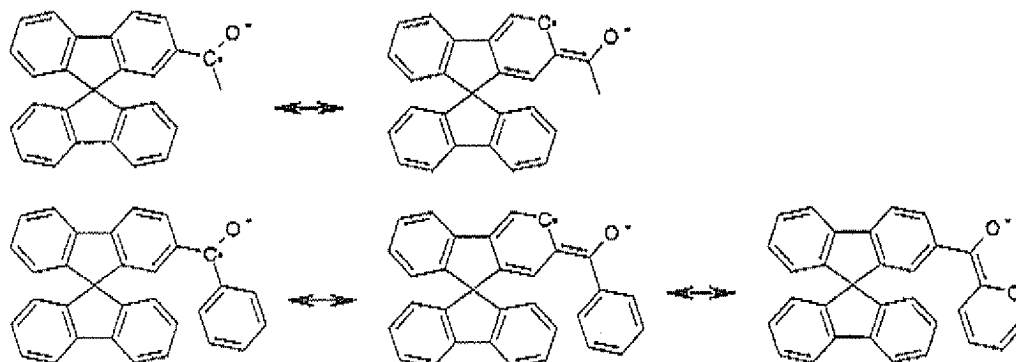
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

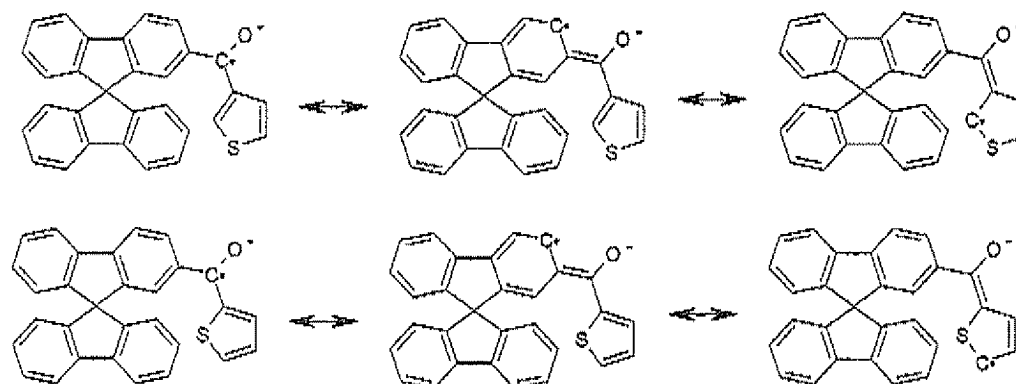
1. I, Dr. Philipp Stoessel am a citizen of the Federal Republic of Germany and reside at Sophienstrasse 30, 60487 Frankfurt, Germany, hereby declare and say as follows:
2. I am a fully trained chemist, having studied chemistry at the University of Tuebingen, Baden-Wuerttemberg, Germany.  
I am well acquainted with technical English.
3. Work experience:  
1986 – 1996: Studies in chemistry at the University of Tuebingen, Germany  
1996 – 1998: Postdoctoral research in chemistry sponsored by the  
Alexander von Humboldt Foundation with Dr. J. R. Norton at the  
Colorado State University, Fort Collins, CO and at the Columbia  
University New York, NY.  
1998 – 1999: Material Scientist and Synthetic Chemist at the Institut fuer Neue  
Materialien, Saarbruecken, Saarland, Germany  
1999 – 2005: Material Scientist and Synthetic Chemist at COVION Organic  
Semiconductors GmbH, Frankfurt, Hessen, Germany  
2005 – today: Material Scientist and Synthetic Chemist at the Merck Organic Materials  
GmbH, Frankfurt, Hessen, Germany

4. In the field of organic light emitting diode (OLED), I am an inventor on more than 70 U.S. patents and patent applications and an author of more than 10 publications and lectures.
5. In view of my qualifications as outlined above, I consider myself to be an expert and to be skilled in spirobifluoroene (SBF) compounds and OLED field.
6. I have read and reviewed U.S. Serial No.: 10/523,101 (" '101 application") including the office actions and responses.
7. The Examiner asserted in paragraph no. 7, at page 5 of the Advisory Action mailed May 14, 2008, "[g]iven the broad claims, there are several reasons, as described why the scope of the claims cannot be supported by a single example showing an unsubstituted phenyl substituent. As stated prior, the arguments of counsel cannot take the place of evidence. Evidence supporting particular substituents or particular heterocyclic systems, along with claims which are within the scope of the supporting evidence are required."
8. I believe that the scope of the claims is supported by the example in the specification and the two additional examples found in the declaration executed March 1, 2008.
9. The claimed invention has better performance than the corresponding acetyl compounds. One possible reason for the better performance of the inventive compounds compared to the corresponding acetyl compounds might be based on the better mesomeric stabilization of the corresponding radical anion. Even though the acetyl compound is stabilized by mesomerism as well, the stabilization in this compound seems not to be sufficient to obtain a high operational lifetime. Some mesomeric structures of the acetyl and the benzoyl compound are shown in the following (not all possible structures are shown):

10.



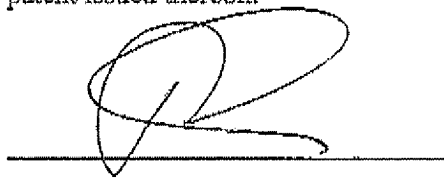
11. This concept of mesomeric stabilization is valid for all inventive compounds with any aromatic substituent, for purely aromatic hydrocarbons as well as for heteroaromatic groups. This is shown in the following schematically for a compound wherein A is 2-thienyl or 3-thienyl (not all possible mesomeric structures are shown):



12. As shown above, the mesomeric stabilization is equivalent for compounds wherein A is an aromatic or heteroaromatic compound. In particular the mesomeric stabilization of the radical anion is independent of the fact that thiophene as well as pyrrole or furan are electron-rich heteroaromatic groups because the negative charge is mainly located on the oxygen of the carbonyl group and the heteroaromatic group stabilizes the radical. The assumption of the Examiner that free radicals of these compounds may become localized therefore is not true (at the bottom of page 3 to the top of page 4 of the Advisory Action mailed April 17, 2008).

13. Also the argumentation of the Examiner in paragraph no. 9 of the Advisory Action mailed April 17, 2008, with respect to steric shielding cannot be followed. The Examiner asserts that a better steric shielding of the carbonyl group would be predicted to have negative effects, such as an increase in driving voltage. This is not the case as can be seen from examples 3 and 4 of the declaration executed March 1, 2008, wherein the power efficiency, which is calculated from the efficiency and from the driving voltage, is higher for the inventive compound than for the comparative acetyl compound. The higher stability of a compound can be clearly seen in the higher lifetime of the organic electroluminescent device wherein the device with the inventive compound shows more than double the lifetime compared to the device with the comparative compound.
14. It is known that a compound with an acetyl group, such as the acetyl substituted spirobifluorene, can show an aldol type condensation reaction after deprotonation. This reaction is not possible with the aroyl substituted spirobifluorene. It might well be the case that the inventive compounds can contain groups, which can be deprotonated, such as hydroxy groups, but these groups do not result in any side reactions.
15. For the reasons stated above, the experimental results given in the declaration for a single compound and the two compounds in the declaration combined with the facts/argumentation as given above, I believe that a person of ordinary skill in the art would find sufficient to support for the full scope of the claims.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



25th of June 2008  
Date